

### REMARKS

By the *Office Action* of 22 December 2003, Paper No. 11, Claims 2-38 and 40-78 are pending in the Application, and all rejected.

#### 1. Supplemental Response and Amendment

As Examiner concedes, agreement to allowance of the Claims after submission of the 5 December 2003 *Supplemental Response and Amendment* was reached, but such allowance revoked, as the Examiner uncovered new art.

Nonetheless, the Applicant thanks the Examiner for the telephone conference/interview on 5 December 2003, that came to an agreement that the combinations of Claims 1 and 18, and Claims 39 and 58, were allowable over the cited art of the 1 July 2003 *Office Action*.

#### 2. The Pending Claims

Claims 18, 25, 58, 65 and 78 are presently amended.

Claims 18 and 58 are amended to include the following recitations: (i) a tapered part is provided between the flexural range and the peripheral regions; (ii) the thickness of the tapered part is gradually reduced toward the peripheral regions; and (iii) the ratio of reduction of the thickness of the tapered part varies with the distance between the center of the flexural range and the outer periphery of the face.

Claim 78 is amended to include the following recitations: (i) a tapered part is provided between the first and the second regions; (ii) the thickness of the tapered part is gradually reduced toward the peripheral thereof; and (iii) the ratio of reduction of the thickness of the tapered part varies with the distance between the center of the first region and the outer periphery of the face.

Basis for these amendments to Claims 18, 58 and 78 are found in the *Specification* as originally filed. Namely, as disclosed at *Page 21, Lines 30-31*, and *Page 25, Lines 1-4*, respectively:

The thickness of a tapered part 13 defined by the ellipse 17 is gradually reduced toward the periphery thereof.

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In other words, the ratio of reduction of the thickness of the tapered part 13 varies with the distance between the sweet spot (the center of a flexural range) 15 and the outer periphery of the face 2.

Further basis for the amendments are found in the figures, with the tapered part 13 shown in FIGS. 7-19, 21-80 and 84-85

Claims 25 and 65 are amended to recite that the club has only non-concentric regions, which distinguish these Claims, and those dependent therefrom, even further from the disclosures of the cited references, and thus patentable.

### 3. The Pending Claims Are Patentable

Regardless of the prosecution history as described below, the presently pending Claims are believed allowable, as none of the cited references, either alone or in combination, disclose, teach or suggest the concept of providing *a tapered part*, as recited in currently amended Claims 18, 58 and 78. Thus, notwithstanding the reliance upon Blough et al., the Claims are believed patentable as each ultimately includes the recitation of a tapered part, not found in the cited references.

The present rejection of the Claims is nearly identical to the rejection of the Claims in Examiner's previous *Office Action* of 1 July 2003, Paper No. 9, wherein Claims 1-78 were pending in the Application, and all rejected. In that 1 July 2003 *Office Action*, the Examiner withdrew an even earlier § 102 rejection over Werner et al., but suggested that Claims 1-18 and 39-57 were rejected under 35 U.S.C. § 103(a) as obvious over Werner et al., and that Claims 18-38 and 58-78 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Werner et al. in view of two Kosmarka references, the '603 and '868 references.

The Applicant first overcame the prior § 102 rejection over Werner et al., *then* overcame the 103(a) rejection over Werner et al., *then* overcame the 103(a) rejection over Werner et al. in view of two Kosmarka.

The Examiner now introduces US Patent No. 6,120,388 to Blough et al., and suggests that this new reference, in various combinations with Werner et al. and Kosmarka, makes the pending Claims obvious. Yet, the reliance upon Blough et al. is misplaced, and the Claims are believed allowable as presented herein.

4. **US Patent No. 6,120,388 to Blough et al.**

Blough et al. discloses a club head, wherein the back side is open, and has stepped thicknesses, thickest to thinnest, from the bottom portion 104 to the top portion 105 of the club back side, using weighted pads.

It is respectfully submitted that since the Examiner misconstrues the teachings of Blough et al., the Examiner's rejection of the Claims is in error.

A. **The sweet spot region B *does not* have a greater thickness than its periphery regions.**

The Examiner rejects the Claims by alleging that the sweet spot region B of Blough et al. has a thickness greater than its periphery regions. As this allegation about the disclosure of Blough et al. is incorrect, and the reliance by the Examiner upon this teaching to provide a ground of rejection against the present Claims is thus flawed.

Region B of the Blough et al. club has a thickness of weight pad level 4. The only teaching of thicknesses of relative regions is from the figures, specifically Figs. 7, 9, 11, 13 and 15. As clearly shown, the periphery regions 9-12 each have a *greater* thickness than region B.

It appears the Examiner is perhaps suggesting that the only periphery regions of the Blough et al. club are the two non-striking regions C<sub>1</sub> and C<sub>2</sub>, with weight pad levels 1 and 8. But that would be disingenuous, and contrary to the teaching and disclosure of Blough et al., as clearly the regions 9-12 are a part of each embodiment disclosed.

Thus, to allege that the sweet spot region B of Blough et al. has a thickness greater than its periphery regions is wrong, as the thicknesses of periphery regions 9-12 each have a greater thickness than region B.

B. **Blough et al. discloses *concentric* regions, not non-concentric regions as claimed.**

The Examiner rejects the Claims by alleging that Blough et al. discloses a golf club having various non-concentric regions. Yet, the very examples used by the Examiner, and the disclosure itself, teach just the opposite. The sweet spot B is *concentric* in view of regions A, C and D. That is, region B is wholly within region A. Region B is completely surrounded by

region A. Further, while C<sub>1</sub> and C<sub>2</sub> are indeed non-concentric to each other, C<sub>1</sub> and C<sub>2</sub> are also wholly within, *concentric* with, region A. Even excluding region A, region D itself is made up of *concentric* regions, thicknesses 9-11.

**C. Blough et al. does not disclose ranges of thicknesses.**

Yet another misinterpretation of the teachings of Blough et al. by the Examiner is apparent when the Examiner alleges that Table 1 illustrates *thicknesses* of regions of the club head. It does not. Table 1 shows only *areas* of weight levels, not thicknesses. *See Table 1; Col. 3, Lines 7-10.* The *area* of each region is in the units of square centimeters, providing simply no teaching on thicknesses of the various regions, except to show relative thicknesses to one another.

**D. Not only does Blough et al. teach away from the claimed invention, but it is also silent on the subject matter and recitations of the pending Claims.**

As shown above, not only does Blough et al. teach away from the claimed invention by disclosing the exact opposite of what the Examiner alleges regarding the thickness of region B, and the exact opposite of what the Examiner alleges regarding non-concentric regions, but Blough et al. also suffers from the same infirmities as Werner et al. and Kosmatka. Blough et al. is completely silent as to any disclosure on specific flexural ranges, yet the pending Claims specifically recite limits as to flexural ranges. It appears once again that Examiner is providing an inherency argument with Blough et al., which simply cannot be maintained.

**5. Claims 2-38 and 40-78 Are Allowable, and Not Obvious In View Of Blough et al. in combination with Werner et al. and Kosmatka.**

All the Claims are rejected under 35 U.S.C. § 103(a) as obvious over Blough et al. in combination with Werner et al. and Kosmatka. The Applicant respectfully submits the obviousness rejection is untenable, as the Examiner does not provide a *prima facie* case of obviousness, a burden which the Examiner must meet.

**A. None of the cited references disclose a tapered part as recited in the Claims.**

Initially, none of the cited references, either alone or in combination, disclose, teach or suggest the concept of providing a *tapered part*, as recited in currently amended Claims 18, 58 and 78.

Further, it is possible to relax the stress concentration in the face by providing the tapered part.

It is respectfully submitted that the present amendments present novel and non-obvious Claims over the cited art. Although these amendments are themselves sufficient to overcome the cited art, the following is presented to further the case.

**B. Blough et al.**

The Examiner relies on disclosures in Blough et al. that do not exist, and in fact teach away from the present invention (items 4A-4C above), and/or conclusory assertions that either Blough et al. or Werner et al. inherently discloses what is claimed by Applicant. As such, it is submitted the pending Claims are novel and non-obvious over the cited references.

It further appears that the Examiner's rejection to Claims 2-38 and 40-78 concerns itself only with the independent Claims 18 and 58. The Examiner does not provide specific rejections, and does not point to specific disclosure in the cited references to support the rejections, of the dependent Claims, each of which dependent Claim has other novel and non-obvious features over the cited references. This is the third *Office Action* that appears to insufficiently support the rejection of Claims.

The Examiner first suggests that the sweet spot region B of Blough et al. has a thickness greater than its periphery regions. This is wrong, as explained above, and thus reliance on this aspect of Blough et al. to reject the Claims is in error.

The Examiner further suggests that Blough et al. discloses a golf club having various non-concentric regions. This too is wrong, as explained above, and thus reliance on this aspect of Blough et al. to reject the Claims is in error.

The Examiner next suggests that Blough et al. discloses thicknesses of regions. This too is wrong, as explained above, and thus reliance on this aspect of Blough et al. to reject the Claims is in error.

The Examiner additionally suggests that Blough et al. and/or Werner et al. disclose varying the thickness of the face of a golf club head, and that this, in and of itself, *inherently* teaches the Applicant's claimed subject matter, although the Claims are silent as to face

thickness. This too is wrong, as explained above, and thus reliance on these aspects of Blough et al. and/or Werner et al. to reject the Claims is also in error. These characterizations of Blough et al. and/or Werner et al. are inaccurate, and this ground of rejection is not sound. First, the combination of inherency and obviousness as presented by the Examiner is not a strong rejection position - as inherency is really an anticipation rejection.

The trouble in the inherency argument provided by the Examiner has been addressed by the Board of Patent Appeals and Interferences:

[T]he examiner talks in terms of inherency (which is really an anticipation rationale) while on the other hand the examiner talks in terms that it would have been obvious to experiment to divine optimum conditions.

Inherency and obviousness are somewhat like oil and water – they do not mix well. *56 USPQ2d 1723, 1725 (BPAI 2000) (unpublished).*

Further, there exists no “similarity” test for obviousness, although the Examiner appears to suggest that if Blough et al. and/or Werner et al. inherently teach similar ranges of the present Claims, then the Claims are obvious.

Applicant’s *invention* is defined by Applicant’s Claims, and nowhere in any of the 78 pending Claims is there novelty or non-obvious related solely to the thickness of the faceplate. Applicant’s invention is a novel and non-obvious range of flexure found through investigation and rigorous testing. The Examiner appears to reject the Applicant’s *figures*, or *Specification*, relating to thickness of the face in embodiments of the Applicant’s disclosure, but Applicant does not claim thickness.

It appears the Examiner neglects the notion that the Applicant’s invention is recited in the Claims. Simply put, Applicant’s Claims *do not recite* a golf club head with variation of thickness in the face, as the Examiner suggests the cited references teach.

The Applicant has invented a novel and non-obvious club that has a very particular range of flexure, while the cited references are in the company of literally thousands who are working to adjust face thickness, arrangements of thickness, pitch, and other head characteristics to improve golf strokes. But to use the cited references to reject as obvious all future improvements in club heads that try to improve strokes is clearly improper. The cited references can only go so far to reject as obvious such future inventions.

But the present case is even more distinguishable, as the Applicant recites ranges of flexure, which ranges in the Claims are not limited to changes in thickness of the face, but could, for example, also be due to material characteristics of the face. The Claims are silent as to such causes of flexural ranges.

Not only as the BPAI spoken to the misapplication of the Examiner's conclusory inherency rejection, but the Federal Circuit also has provided guidance related to the present situation, where an Examiner improperly uses a reference to extinguish new innovations, as explained in Continental Can Co. v. Monsanto Co., 948 F.2d 1264, 1269, 20 U.S.P.Q.2D (BNA) 1746, 1749 (Fed. Cir. 1991), discussing inherency in the context of obviousness:

Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. [Citations omitted.] If, however, the disclosure is sufficient to show that the natural result flowing from the operation as taught would result in the performance of the questioned function, it seems to be well settled that the disclosure should be regarded as sufficient.

Not only does the Examiner fail to provide the *prima facie* case of obviousness in view of Continental Can Co. by the Examiner's conclusory statements that the cited references teach or suggest Applicant's invention, but Applicant submits that both Blough et al. and Werner et al. *teach away* from the claimed ranges of Applicant's invention. Blough et al.'s and Werner et al.'s disclosures are not sufficient to show that the natural result of very specific thickness adjustments to the face of a club would result in the specific range of flexure claimed by the Applicant. The Examiner thus violates the dictates of Continental Can Co.

The present Application illustrates that Blough et al. and Werner et al. *teach away* from the present invention, and this argument has not be rebutted by the Examiner. The arguments that Blough et al. teaches away from the present invention are clearly provided above, as each of Examiner's statements as to what Blough et al. teaches or suggests is wrong, and even opposite to what is disclosed by Blough et al.

As to Werner et al., the *Specification* expressly notes that clubs with varying thickness face walls have, in fact, a very large range of flexure, and clearly outside the recited range of Claims 1-3. Tables 2-5 illustrate that even with varying thickness face walls, the range of flexure

is quite wide, and well outside the range of Claims 2, 3, and 79. Claims 2, 3, and 79 *do not* recite that the clubs have a varying thickness of face wall, but that *a range of flexure is well managed*, and Tables 2-5 show that clubs like those in Werner et al. suffer the specific disadvantages the present Application attempts to overcome. As shown in *Specification, Page 12, Line 29 - Page 14, Line 11*:

Tables 2 to 4 show the thickness distributions of the models 1 to 3 respectively.

Table 2

Major axis (mm)	Minor axis(mm)	Thickness (mm)
10	5	3.0
15	7.5	2.9
20	10	2.8
25	12.5	2.7
40	20	2.6

Table 3

Major axis (mm)	Minor axis (mm)	Thickness (mm)
10	5	3.0
15	7.5	2.9
40	20	2.6

Table 4

Major axis (mm)	Minor axis (mm)	Thickness (mm)
5	2.5	2.6
7.5	5	2.7
10	7.5	2.8
12.5	10	2.9
40	20	3.0

Table 5 shows quantities of flexure (unit: mm) measured by applying loads to the points a, b and c of the models 1 to 3 along the major axes on positions of 0 mm along the minor axes.

Table 5

unit (mm)

Position of Load in Direction of Major axis	Model 1	Model 2	Model 3
0 mm Point a	0.428	0.443	0.478
10 mm Point b	0.296	0.307	0.338
20 mm Point c	0.206	0.214	0.172

As shown in Table 5, the model 3 exhibiting a quantity of displacement of 0.478 mm at the face center is displaced only by 0.172 mm, i.e. 37 % of the displacement at the face center, at the offset position of 20 mm. Consequently, the model 3 exhibits rather inferior bounce in an offset shot.

On the other hand, the models 1 and 2 having thicknesses reduced from the face centers toward the peripheries exhibit remarkably larger quantities of flexure of 0.428 mm and 0.443 mm at the face centers respectively as compared with a sample of the model 1 having a thickness of 3 mm shown in Table 1 with flexure of about 48 %, i.e. about half the quantities of flexure at the face centers, at the offset positions of 20 mm. Therefore, bounce of this type of golf club head in an offset shot can be improved by reducing the thickness of the face from the face center toward the periphery.

Table 5 of the present Application illustrates that varying the face wall thickness even .4 mm over 20 mm leads to a variation of flexure of 37% of the maximum quantity of flexure, *which is outside the limits of Claim 18*. The variation of face wall thickness in Werner et al. is 1.78 mm as shown in Fig. 3 over 50+ mm, and .26 mm over 20 mm. There is simply no teaching in this reference that such variations of face wall thickness would provide the range of flexure as recited in the Claims. Further, the wall thicknesses of Werner et al. are from 6.86 to 5.08 mm, while the wall thickness in Tables 2-4 range from 2.6 mm to 3.0 mm.

The present invention is an improvement over a Blough et al.- and/or Werner et al.-type club head. Blough et al. and/or Werner et al. simply disclose a club with a varying thickness face wall, and provide one example of such thickness changes. The present invention provides a wall face of a club that has a specific range of flexure. In fact, Claims 18, 58 and 78, the only independent Claims, *do not* recite any limitations as to face wall thickness, but only to a very precise range of flexure. Blough et al. and Werner et al. are silent on ranges of flexure, and it is

respectfully not clearly understood how such silence in the reference can provide a § 103 rejection, particularly one that relies on inherency.

The objects of Blough et al. and Werner et al. are to provide a face wall formed to realize maximum face strength with minimum face mass. As such, Blough et al. and Werner et al. disclose a face wall that has a varying thickness. That is it, and that puts the references in the company of many prior art references that disclose varying the face wall thickness of a club. But this is not what is claimed in the present Application. The present invention is concerned with, and the Claims specifically recite, limitations as to variations in a range of flexure of the face. That Blough et al. and Werner et al. attempt to provide a larger sweet spot by varying the face wall thickness is a long way from disclosing the present invention's use of limiting the range of flexure in the face.

As to the dependent Claims, Blough et al. and Werner et al. disclose no specifics as to sweet spot size or configuration, discloses no specifics on flexural ranges, discloses no specifics on spring constants. The *only* specifics Werner et al. provides is a depiction of varying thickness of the wall face shown in Fig. 3.

The Blough et al. and Werner et al. references are no different in presenting a club with varying face wall thickness than prior art discussed in the present Application, which is decidedly distinguished by the present Claims. For example, a varying thickness wall is disclosed in Japanese Patent Laying-Open No. 9-192273, as disclosed in the Application:

Japanese Patent Laying-Open No. 9-192273 (1997) discloses a golf club head of a metal according to second prior art, which is provided with a face center part in a thickness having sufficient strength for withstanding impact applied by collision with a golf ball and a peripheral part having a smaller thickness than the face center part. *Specification, Page 1, Lines 18-21.*

At least one distinction between this Japanese reference and the present invention, which is similar to the distinction of the both the Blough et al. and Werner et al. references, is that the change in face thickness is *not* related to a specific range of flexure, *nor* an elliptical hitting zone:

In the golf club head according to the second prior art (Japanese Patent Laying-Open No. 9-192273), the peripheral portion is not arranged in response to the hitting point distribution of the player either and hence the

carry of a golf ball is remarkably reduced by an offset shot although the ball carries enough when hit at the face center of this golf club head.  
*Specification, Page 3, Lines 15-19.*

That Blough et al. and Werner et al. disclose varying thickness of the face wall provides *no insight or teaching* of the recitations of Claim 18 of the present Application, that

- a flexural range, defined in the face of the head, has a *range of quantity* of flexure in a direction perpendicular to the face of at least 45%, and not more than 95%, of the maximum quantity of vertical flexure of the face (the term "flexural range" stands for a partial region of the face flexed in excess of a prescribed quantity when a vertical load exceeding a prescribed value is applied to the face), or
- a flexural range *arranged* according to a hitting point distribution range of a player in the face.

Neither of these limitations is taught in any of the cited references, nor are they inherent in the clubs of the cited references. The cited references are silent to both of these recitations of Claim 18.

Even if the Examiner maintains the rejection of Claim 18 by holding that one or more of the cited references teach a range of flexure of between 45%-95% of maximum flexure, which they do not, Applicant respectfully submits the Examiner once again fails to properly support a rejection of the dependent Claims, that, for example, even narrower ranges of flexure recited in Claims 2 and 3 (70%-95% and 90%-95%) are obvious, as these ranges surely are not disclosed in the cited references, and are not simply design characteristics inherent in the cited references' clubs.

Other of the presently § 103 rejected Claims go even further in defining the shape, location, and other characteristics of the flexure range, and such recitations are not shown in the cited references. The flexural range is the region enclosed within the ellipse 16 of, for example, Figs. 7-23. The present Application places preferred size and location limits of the flexural range, for example:

Therefore, the area of the flexural range having the aforementioned spring constant is at least 75 mm<sup>2</sup> and not more than 1260 mm<sup>2</sup>, preferably at least 75 mm<sup>2</sup> and not more than 707 mm<sup>2</sup>, and more preferably at least 75 mm<sup>2</sup> and not more than 314 mm<sup>2</sup>. Further, the area of the flexural range is preferably at least 3 % and not more than 50 % of the area of the face 2, and more preferably at least 5 % and not more than 30 % of the area of the face 2. *Specification, Page 18, Lines 9-15.*

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The area of a hitting point distribution of a low handicapper is about 150 mm<sup>2</sup> and that of a hitting point distribution of the general player is 1500 mm<sup>2</sup>, and hence the area of the flexural range is preferably 150 to 1500 mm<sup>2</sup>. *Specification, Page 18, Line 31, Page 19, Line 1.*

Several of the Claims recite specific location and sizes of the flexural range, which recitations are not disclosed in the cited references. For example, Claim 6 recites an inclination of a major axis of the flexural range, again to which the cited references are silent.

Applicant respectfully traverses this rejection as none of the cited references teach or suggest a flexural range as limited by the present Claims, as fully described above. While it is no doubt the intent of, for example, Werner et al. to provide a larger hitting face on a club, it simply does not provide a teaching of limiting the flexural range to a percentage of a maximum quantity of vertical flexure or of a spring constant. (All Claims).

As to what the Examiner suggests the Blough et al. reference teaches is exactly *opposite*, and *teaches away* from, the Claims. Many of the Claims recite that the plurality of peripheral regions are *non-concentric*. Such an arrangement of peripheral regions is neither taught nor suggested in the cited art, or taught *away from* by Blough et al. and Kosmarka.

In the club heads of the present invention as illustrated in Figs. 9-12, 14-17, 19, 21, 23-51, as examples, the regions 140, 141, 142 and 143 are *non-concentric* regions of constant thickness, wherein in some embodiments the face *will not* have a symmetrical face thickness. The regions 140-143 are discrete regions, not annular, nor stacked one within the other.

The Examiner cites Blough et al. to reject the Claims as to non-concentricity. Yet, as discussed above, Blough et al. could not be clearer in showing concentric peripheral regions.

## 6. Fees

No Claims fees are due, as the total number of Claims remains unchanged by the present *Response and Amendment*.

Further, this *Response and Amendment* is being filed within three months of the *Office Action*. Thus, it is believed no extension of time fees are due.

Nonetheless, authorization to charge deposit account No. 20-1507 is given herein should fees be due.

### CONCLUSION

By the present *Response and Amendment*, the Application has been in placed in full condition for allowance. Accordingly, Applicants respectfully request early and favorable action. Should the Examiner have any further questions or reservations, the Examiner is invited to telephone the undersigned Attorney at 404.885.2773.

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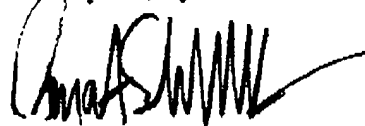
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